

Application No.: 09/597,160

Docket No.: 21994-00007-US

**AMENDMENTS TO THE SPECIFICATION**

*Please amend the specification as follows:*

*Please replace the paragraph on page 1, lines 16-19 with the following amended paragraph:*

a<sup>1</sup>  
An electronic watermark is a technique of embedding a certain information in a multimedia data such as image and sound and concealing the certain information. ~~There provided various methods of concealing~~ Various methods of concealing are provided.

*Please replace the paragraph on page 2, lines 5-15 with the following amended paragraph:*

a<sup>2</sup>  
G. Caronni proposed that a tag, which is a small geometrical pattern, ~~was be~~ added to an electronically processed picture in an intensity level, which is hardly perceived visibly, is proposed in the thesis titled "Assuring Ownership Rights for Digital Images" in the Proc. Reliable IT Systems, VIS '95, 1995. A method of embedding an electronic watermark signal, which ~~is resemble~~ resembles to quantization noise is described in the theses "Embedding Secret Information into a Dithered Multi-level Image" in the IEEE Military Comm. Conference, pp. 216-220, 1990 by K. Tanaka and "Video-steganography" in the IMA Intellectual Property Proc., VI, pp. 187-206, 1994 by K. Mitsui et al. respectively.

*Please replace the paragraph on page 2, lines 16-20 with the following amended paragraph:*

a<sup>3</sup>  
A method of inserting an electronic watermark signal into a pixel allocated in a vicinity of an outline of a picture in the least significant bit is described in the thesis titled "Cryptology for Digital TV Broadcasting", Proc. Of the IEEE, 83(6), pp. 944-957, 1995, by Macq and Quisquater.

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*Please replace the paragraph starting on page 2, line 26 and continuing onto page 3, line 3 with the following amended paragraph:*

ay  
MPEG signal, which is one of compressed signals, to be inserted with an electronic watermark signal is depicted next. Essentially MPEG is a name of an organization, "Moving Picture Experts Group". However, it currently represents standards or specifications for coding signals. Accordingly, MPEG is composed of several techniques.

*Please replace the paragraph on page 3, lines 11-26 with the following amended paragraph:*

as  
In the subtracter 42, a difference between an input picture signal and a locally decoded picture, which is predicted for motion compensation by the predictor 41, is subtracted from the input picture signal. Accordingly, a time redundancy portion is ~~deleted from~~ from the input picture signal. There exist 3 modes of predicting directions: "past", "future" and "both past and future". Further, these modes can be used by switching each macro block (MB) of 16 pixels multiplied by 16 pixels. A direction of prediction is decided by a picture-type given to the input picture signal. ~~There is existed~~ exists 2 modes of "predicting from past" and "encoding an MB independently without predicting" in a predictive coded picture (P-picture). ~~There is existed~~ exists 4 modes of predicting future", "past", "both past and future" and "encoding a MB independently without predicting" in a bi-directionally predictive coded picture (B-picture). Furthermore, encoding all MBs independently is an intra-coded picture (I-picture).

*Please replace the paragraph starting on page 3, line 27 and continuing onto page 4, line 9 with the following amended paragraph:*

ak  
A motion vector is detected with the accuracy of half pel or half-pixel after performing a pattern matching of a motion area at each MB and motion compensation is predicted by shifting it with a motion component. ~~There is existed~~ exists 2 directions of

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horizontal and vertical in a motion vector. The direction is transmitted as an additional information of MB in conjunction with a motion compensation (MC) mode, which indicates a prediction ~~from where~~. From a first I-picture to a picture preceding a second I-picture is called a group of pictures (GOP). In a case that the GOP is used in storage media such as an optical recording medium and a magnetic recording medium, approximately 15 pictures are used in general.

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*Please replace the paragraph on page 5, lines 15-28 with the following amended paragraph:*

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a7  
With respect to an insertion frequency of electronic watermark signals in the prior art mentioned above, it ~~almost~~ depends upon ~~an~~ the application. For example, in ~~a~~ the case of picture data, electronic watermark signals are scattered by using several frames of pictures ~~with depending upon a method of electronic watermark~~. In this case, it shall be a configuration of combining several frames. Otherwise there ~~is existed~~ exists a problem that an electronic watermark signal ~~can not~~ cannot be read out. Further, a case that an electronic watermark signal is recorded in one frame at each of several frames can be considered. In this case, there ~~is existed~~ exists another problem that an electronic watermark signal may disappear from a frame recorded with an electronic watermark signal if a frame not recorded with an electronic watermark signal is extracted.

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*Please replace the paragraph on page 6, lines 4-9 with the following amended paragraph:*

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a8  
Furthermore, in a case of audio data, there ~~is existed~~ exists a case that electronic watermark signals are scattered in the audio data using a specific number of samples. In this case, it shall be a configuration of combining the specific number of samples. Otherwise ~~further problem that~~ an electronic watermark signal ~~can not~~ cannot be read out ~~occurs~~.

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*Please replace the paragraph on page 6, lines 14-23 with the following amended paragraph:*

99

Accordingly, in consideration of the above-mentioned problems of the prior art, an object of the present invention is to provide a recording apparatus and a recording method of an electronic watermark, which can hold an electronic watermark signal of which content is always equivalent to a first electronic watermark signal while extracting a contents data of a less smaller amount of information than a predetermined unit of information from an original contents data wherein the original contents data is recorded with the first electronic watermark signal by each or throughout the predetermined unit of information.

*Please replace the paragraph on page 7, lines 8-17 with the following amended paragraph:*

110

According to another aspect of the present invention, ~~there provided a recording method of an electronic watermark comprising a recording method of an electronic watermark is provided including:~~ a step of detecting a first electronic watermark signal from an original contents data inputted, a step of storing the first electronic watermark signal detected in the step of detecting temporarily, a step of extracting a part of contents data from the original contents data and a step of inserting a second electronic watermark signal of which content is equivalent to that of the first electronic watermark signal in the contents data extracted in the step of extracting.

*Please replace the paragraph on page 7, lines 18-20 with the following amended paragraph:*

11

~~Other object~~ objects and further features of the present invention will be apparent from the following detailed description when read in conjunction with the accompanying drawings.

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*On page 8, line 20, please delete the phrase in its entirety:*

~~{First Embodiment}~~

*Please replace the paragraph starting on page 9, line 17 and continuing onto page 10, line 9 with the following amended paragraph:*

Q<sup>12</sup>  
In a case that a contents signal is a picture data, an electronic watermark signal is scattered in several frames by using some frames of a picture by an electronic watermark system as mentioned above, that is, an electronic watermark signal is recorded over some frames of picture. In this case, the picture data shall be a configuration of combining several frames. Otherwise the electronic watermark signal ~~can not~~ cannot be read out. Further, another case can be considered were an electronic watermark is recorded in one frame at each of several frames. In this case, if a frame signal not recorded with an electronic watermark signal is extracted, the frame signal disappear from the picture data, which is extracted by the electronic watermark signal, as a matter of fact. Furthermore, an electronic watermark signal is not always recorded in a data, which is extracted from a specific area in a frame, even though an electronic watermark signal is recorded at each frame. Moreover, in a case of audio data, an electronic watermark signal is scattered by using a specific number of samples ~~as a~~ in the same manner as the case of picture data. In this case, the audio data shall be a configuration of combining a specific number of samples. Otherwise the electronic watermark signal cannot be read out.

*Please replace the paragraph on page 10, lines 10-17 with the following amended paragraph:*

Q<sup>13</sup>  
In order to solve these problems, the ~~inserter 1~~ inserter 4 shown in Fig. 1 records a new electronic watermark signal (second electronic watermark signal) of which content is equivalent to that of an originally recorded electronic watermark signal (first electronic watermark signal) by using a method of a less data amount of contents data necessary for

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inserting an electronic watermark or a less sampling number than that of the originally recorded electronic watermark (first electronic watermark) signal.

*On page 11, line 8, please delete the phrase in its entirety:*

~~{Second Embodiment}~~

*Please replace the paragraph on page 11, lines 12-16 with the following amended paragraph:*

*A14*  
In Fig. 2, a recording apparatus of an electronic watermark comprises a detector 1 of signal, a memory 2 for electronic watermark contents, an extractor 3 of contents signal, an inserter 4 of electronic watermark signal is temporarily stored in the memory 2. The inputted contents information is transmitted to the extractor 3 thereafter. In the extractor 3, a part of a contents signal ~~is extracted~~ exists from an original contents signal.

*On page 13, line 24, please delete the phrase in its entirety:*

~~{Third Embodiment}~~

*Please replace the paragraph on page 14, lines 18-23 with the following amended paragraph:*

*A15*  
In Fig. 4, a decoding section of the recording apparatus of an electronic watermark comprises an MPEG decoder 13, a detector 1 of signal, a memory 2 for electronic watermark contents, an extractor 3 of contents signal, an inserter 4 of electronic watermark, a decider 5 for judging whether or not an electronic watermark signal ~~is existed~~ exists and a switch.

*On page 15, line 25, please delete the phrase in its entirety:*

~~{Fourth Embodiment}~~

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*Please replace the paragraph on page 17, lines 6-18 with the following amended paragraph:*

a/b  
The third and fourth embodiments shown in Figs. 3 through 5 disclose that an electronic watermark signal is recorded in an intra-picture of which picture quality is most improved ~~while~~ with the MPEG compression. In a case of extracting other picture data than an intra-picture when decoding, a new electronic watermark signal of which content is equivalent to that of an electronic watermark signal originally recorded in the intra-picture is recorded in the picture data to be extracted. Accordingly, an electronic watermark signal can be recorded efficiently and contents of the electronic watermark signal can be held even though data of a specific part of a contents information, which is compression encoded by the MPEG system, is extracted.